Course title: Principles of Cartography			
Course code: NRG 171	**No. of credits:** 3	**L-T-P:** 20-8-28	**Learning hours:** 42
Pre-requisite course code and title (if any): None			
Department: Department of Natural Resources			
Course coordinator: Dr Anu Rani Sharma		**Course instructor:** Dr Anu Rani Sharma	
Contact details:			
Course type: Core		**Course offered in:** Semester 1	

Course Description

In this course, we study the art, science, politics, and technologies of cartography, to understand how maps are created and used to represent and communicate spatial phenomena and their relationships. Course lectures, readings, discussions and lab activities will introduce to the concepts, techniques, hardware, and software used for cartography.

Course objectives

1. To apply principles of map preparation techniques
2. To use different thematic mapping techniques to represent spatial phenomena
3. To design maps for effective communication

Course content

Module	Topic	L	T	P
1	**Introduction to Maps** History of Map making, Basic characters of Map, Type of maps, Cartographic databases.	2		
2	**Map direction and Scale** Fundamentals of Map direction & scale; Construction of different types of scales.	2	2	
3	**Details of Datum, Geodetics and Spheroid** Basic assumptions, Coordinate System: Polar and Cartesian, Geodesy and Geodetic methods, datum types and elements.	4		
4	**Concept of Map Projections** Map projections-Conic projection, Cylindrical projection, Zenithal Projection; Comparison between these projection, Choosing a Map Projection Mercator, Transverse Mercator, Polyconic, Lambert, Orthographic and UTM	2	2	
5	**Map Preparation Techniques and Map accuracy** Map Preparation Techniques: Cartographic design issues, Map design process and compilation	2	2	
6	**Modern Techniques in Cartography and Computers** Generalization, Symbolization, Multivariate and dynamic	2		

	mapping, Modern techniques in Cartography			
7	**Cartography and GIS** Synergy of Cartography and GIS	2		
8	Introduction to perception, visualization, topographic and thematic mapping and color coding	2		
9	**Evaluation Criteria** Evaluation criteria for maps, Map evaluation guidelines	2	2	
	PRACTICALS			
1	**Topographical sheets** Topographical Sheets: Introduction/comparison with respect to types, scales, grid reference, signs and symbols and colour schemes of SOI **Topographical map interpretation** Study and interpretation of Indian topographical maps of survey of India (Series - 1: 50000 or 1: 25000) **Base map and thematic map generation**			8
2	Construction of different type of scale			2
3	Construction of Map projections			4
4	Analog to digital conversion			2
5	Map preparation techniques			2
6	Map designing and Symbolization			4
7	Map evaluation			2
8	Geoprocessing tools			4
	Total	**20**	**8**	**28**

Evaluation criteria

- Test1 [Written Exam]: 10%
- Test2 [Written Exam]: 10%
- Tutorials and assignments: 20%
- Practical (Lab exercise and viva) (Practical is conducted at the end of the semester and includes evaluation of the lab exercises student carried out throughout the semester: 20%
- Test 3 (Test 3 is conducted after completion of the course, at the end of the semester): 40%

Learning outcomes

Upon completion of the course, student will be able to:

1. Design and Geovisualize maps and communicate in perspective [Test1, test2, Tutorials and Assignments, Practical]
2. Critically analyze a map to understand its scientific, social and political utility [Test1, Test2, Tutorials and Assignments, Practical, Test3]

Pedagogical approach

The course will be delivered through class lectures, lab exercise and tutorials.

Materials

Required text

1. Robinson A. H., Morrison J. L., Muehrcke P. C., Kimerling A. J., Guptill S. C. (1995) Elements of Cartography: Wiley Publishers
2. MacEachren A.M. (1994) Some Truth with Maps: A Primer on Symbolization and Design, University Park: The Pennsylvania State University.
3. Mishra R.P. (2014) Fundamentals of Cartography, Concept Publishing Co.
4. Monmonier M. (1991) How to Lie with Maps, Chicago: University of Chicago Press.

Suggested readings

5. Monmonier M. (1993) Mapping It Out, Chicago: University of Chicago Press.
6. Pickles J. (2003) A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World, Taylor & Francis.
7. Sircar D.C.C. (1990) Studies in the Geography of Ancient and Medieval India, Motilal Banarsidass Publishers.
8. Slocum T. (2003) Thematic Cartography and Geographic Visualization, Upper Saddle River, New Jersey: Prentice Hall.
9. Wilford J.N. (2000) The Mapmakers, Vintage Books.

Journals

1. Asian Journal of Geoinformatics
2. Cartographic Journal
3. Geocarto International
4. International Journal of Goeinformatics
5. International Journal of Remote Sensing
6. ISPRS Journal of Photogrammetry and Remote Sensing
7. Journal of Historical Geography
8. Journal of Indian Society of Remote Sensing
   Remote Sensing of Environment

Additional information (if any)

Magazines

1. Coordinates
2. Geospatial today
3. GIM International
4. GIS World
5. GIS@development
6. GPS World

Student responsibilities

Attendance, feedback, discipline, guest faculty etc.

Course Reviewers:

1. Prof. J. K. Garg, Guru Gobind Indraprastha University
2. Dr. Benidhar Deshmukh, IGNOU